

Notice of Allowability

Application No.

09/821,714

Examiner

Vikkram Bali

Applicant(s)

KIM ET AL.

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 7/22/2004.
2. ☒ The allowed claim(s) is/are 1-40 (renumbered as 1-29).
3. ☒ The drawings filed on 29 March 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

DETAILED ACTION

In response to the amendment filled on 7/22/2004, all the amendments have been entered and the action follows:

1. Applicant's arguments, see pages 9-12, filed 7/22/2004, with respect to claims 1-24 have been fully considered and are persuasive. The rejection of claims 1-24 has been withdrawn.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Michael R. Cammarata, #39,491 on 12/13/2004.

The application has been amended as follows:

In claims:

Please amend the claims as follows:

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1. (Previously Presented) A method for detecting defects in an optical fiber, the method comprising:

obtaining an image of the optical fiber;

separating a portion of the image for processing;

determining a blob threshold based on intensities in the portion of the image, to isolate a blob in the portion of the image;

adjusting characteristics of the portion of the image to enhance detection of the blob;

identifying the blob in the image referring to the determined blob threshold;

comparing a characteristic of the blob to blob criteria; and

failing the optical fiber if the blob criteria is not met.

2. (Previously Presented) The method of claim 1, wherein the image includes an object and a background, the portion of the image corresponding to the object.

3. (Previously Presented) The method of claim 2, wherein the object comprises core and cladding of the optical fiber.

4. (Previously Presented) The method of claim 1, wherein the image includes an object and a background, the portion of the image corresponding to the background.

5. (Previously Presented) The method of claim 4, wherein the background comprises supporting structure for the optical fiber.

6. (Previously Presented) The method of claim 1, wherein said determining the blob threshold includes determining a mean intensity of the portion of the image, the blob threshold being based on the mean intensity.

7. (Previously Presented) The method of claim 6, wherein the blob threshold is determined as

$$T_B = \alpha \times I + \beta$$

where T_B is the blob threshold, I is the mean intensity of the portion of the image and α and β are scaling constants.

8. (Previously Presented) The method of claim 1, wherein said adjusting characteristics includes adjusting brightness of the portion of the image.

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9. (Previously Presented) The method of claim 1, wherein said adjusting characteristics includes adjusting contrast of the portion of the image.

10. (Previously Presented) The method of claim 1, wherein said adjusting characteristics includes adjusting brightness of the portion of the image to a low value and adjusting contrast of the portion of the image to a medium value.

11. (Previously Presented) The method of claim 1, wherein the characteristic of the blob is blob intensity, the blob criteria including blob intensity.

12. (Previously Presented) The method of claim 1, further comprising establishing inspection zones in the image, the blob criteria varying for each inspection zone.

13. (Previously Presented) A storage medium encoded with machine-readable computer program code for detecting defects in an optical fiber, the storage medium including instructions for causing a computer to implement a method comprising:

obtaining an image of the optical fiber;

separating a portion of the image for processing;

determining a blob threshold based on intensities in the portion of the image, to isolate a blob in the portion of the image;

adjusting characteristics of the portion of the image to enhance detection of the blob;

identifying the blob in the image referring to the determined blob threshold;

comparing a characteristic of the blob to blob criteria; and

failing the optical fiber if the blob criteria is not met.

14. (Cancelled)

15. (Cancelled)

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (Cancelled)

20. (Cancelled)

21. (Cancelled)

22. (Cancelled)

23. (Cancelled)

24. (Cancelled)

Please add the following new claims:

25. (New) A method for detecting defects in an optical fiber,
the method comprising:

obtaining an image of the optical fiber;
separating a portion of the image for processing;
determining a scratch threshold based on intensities in the portion of the image, to isolate a scratch in the portion of the image;
adjusting characteristics of the portion of the image to enhance detection of the scratch;
identifying the scratch in the image referring to the determined scratch threshold;
comparing a characteristic of the scratch to scratch criteria; and
failing the optical fiber if the scratch criteria is not met.

26. (New) The method of claim 25 wherein the image includes an object and a background, the portion of the image corresponding to the object.

27. (New) The method of claim 26 wherein the object comprises core and cladding of the optical fiber.

28. (New) The method of claim 25 wherein the image includes an object and a background, the portion of the image corresponding to the background.

29. (New) The method of claim 28 wherein the background comprises supporting structure for the optical fiber.

30. (New) The method of claim 25 wherein said determining the scratch threshold includes determining a mean intensity of the portion of the image, the scratch threshold being based on the mean intensity.

31. (New) The method of claim 30 wherein the scratch threshold is determined as

$$T_s = \alpha \times I + \beta$$

where T_s is the scratch threshold, I is the mean intensity of the portion of the image and α and β are scaling constants.

32. (New) The method of claim 25 wherein the scratch threshold is a light scratch threshold, said determining the scratch threshold including determining a mean intensity of the portion of the image and determining a mean intensity of blobs in the portion of the image, the light scratch threshold being based on the mean intensity of the portion of the image and the mean intensity of the blobs in the portion of the image.

33. (Previously Presented) The method of claim 32 wherein the scratch threshold is determined as

$$T_{LS} = \alpha \times I + \gamma \times I_{\text{Blob}} + \beta$$

where T_{LS} is the light scratch threshold, I is the mean intensity of the portion of the image, IBM is the mean intensity of the blobs in the portion of the image and α , γ and β are scaling constants.

34. (New) The method of claim 26 wherein said adjusting characteristics includes adjusting brightness of the portion of the image.

35. (New) The method of claim 26 wherein said adjusting characteristics includes adjusting contrast of the portion of the image.

36. (New) The method of claim 26 wherein said adjusting characteristics includes adjusting brightness of the portion of the image to a medium value and adjusting contrast of the portion of the image to a high value.

37. (New) The method of claim 26 wherein the characteristic of the scratch is scratch intensity, the scratch criteria including scratch intensity.

38. (New) The method of claim 26 further comprising establishing inspection zones in the image, the scratch criteria varying for each inspection zone.

39. (New) The method of claim 26 wherein said detecting the scratch includes morphologically filtering the portion of the image to connect isolated

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defects, a series of morphologically connected defects along a continuous path being detected as the scratch.

40. (New) A storage medium encoded with machine-readable computer program code for detecting defects in an optical fiber, the storage medium including instructions for causing a computer to implement a method comprising:

- obtaining an image of the optical fiber;

- separating a portion of the image for processing;

- determining a scratch threshold based on intensities in the portion of the image, to isolate a scratch in the portion of the image;

- adjusting characteristics of the portion of the image to enhance detection of the scratch;

- identifying the scratch in the image referring to the determined scratch threshold;

- comparing a characteristic of the scratch to scratch criteria; and

- failing the optical fiber if the scratch criteria is not met.

Allowable Subject Matter

2. Claims 1-40 (renumbered as 1-29) are allowed.

3. The following is an examiner's statement of reasons for allowance:

Per the applicant's amendments and the arguments, filed 7/22/2004, with respect to claims are persuasive. And, therefore, the rejection of claims has been withdrawn, and the claims are allowed.


Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vikkram Bali whose telephone number is 703.305.4510. The examiner can normally be reached on 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703.308.6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Vikkram Bali
Primary Examiner
Art Unit 2623

vb
December 14, 2004